Chapter 9
Glossary

9.0 GLOSSARY

***adsorb* —** To gather an atom, ion, or molecule from a gas, liquid, or dissolved solid on a surface in a condensed layer.

***air pollutant* —** Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated, or for which maximum guideline levels have been established because of potential harmful effects on human health and welfare.

***air quality* —** The cleanliness of the air as measured by the levels of pollutants relative to standards or guideline levels established to protect human health and welfare. Air quality is often expressed in terms of the pollutant for which concentrations are the highest percentage of a standard (e.g., air quality may be unacceptable if the level of a single pollutant exceeds its standard, even if levels of other pollutants are well below their respective standards).

***alluvium* —** Clay, silt, sand, gravel, or similar material that has been eroded from rocks transported from the rocks location of origin by gravity, wind, or water and deposited by running water.

***alpha particle* —** Alpha particles consist of two protons and two neutrons. They can travel only a few centimeters in air and can be stopped easily by a sheet of paper or by the skin's surface. (See *neutron*.)

***ambient air quality standards* —** Regulations prescribing the levels of airborne pollutants that may not be exceeded during a specified time within a defined area.

***aquifer* —** A body of rock that is sufficiently porous and permeable (i.e., contains spaces between the rock and soil particles that permit water to move through) to store, transmit, and yield significant quantities of groundwater to wells and springs.

***archaeological resources* —** Resources that occur in places where people altered the ground surface or left artifacts or other physical remains (e.g., arrowheads, glass bottles, pottery). Archaeological resources can be classified as either sites or isolates. Isolates generally cover a small area and often contain only one or two artifacts, while sites are usually larger in size, contain more artifacts, and sometimes contain features or structures. Archaeological resources can date to either the pre-contact, ethnographic, or post-contact eras.

***architectural resources* —** Standing buildings, facilities, wells, canals, bridges, and other such structures.

***area of potential effects (APE)* —** The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

***attainment area* —** An area that the U.S. Environmental Protection Agency has designated as meeting (i.e., being in attainment of) the National Ambient Air Quality Standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.

***average daily traffic* —** The average number of vehicles passing a specific point in both directions in a 24-hour period, normally measured throughout a year.

***bedrock* —** Solid rock underlying loose deposits, such as soil or alluvium.

***beta particle* —** Beta particles are smaller and lighter than alpha particles and have the mass of a single electron. A high-energy beta particle can travel a few meters in air. Beta particles can pass through a sheet of paper but may be stopped by a thin sheet of aluminum or glass. (See *alpha particle*.)

***cancer fatality* —** A death resulting from cancer; also referred to as cancer mortality.

***cancer incidence* —** The occurrence of a cancer; also referred to as cancer morbidity.

***collective dose* —** The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. In this environmental impact statement, collective dose is expressed in units of person-rem.

***concentration* —** The quantity of a substance in a unit quantity (e.g., milligrams per liter or micrograms per kilogram).

***conglomerate* —** Rock composed of rounded pebbles that are cemented together with another mineral substance. Clay, silt, and sand can also be present.

***Council on Environmental Quality regulations* —** Regulations found in Title 10, Code of Federal Regulations, Parts 1500–1508, that direct Federal agencies in complying with the procedures of and achieving the goals of the National Environmental Policy Act.

***core* —** The central portion of a nuclear reactor. The VTR core contains driver fuel assemblies, test assemblies, control assemblies, safety assemblies, reflector assemblies, shield assemblies, and support structures. The active core (consisting of the driver fuel assemblies, test assemblies, control assemblies, and safety assemblies) is where nuclear fission occurs.

***criteria pollutants* —** An air pollutant that is regulated by the National Ambient Air Quality Standards. The U.S. Environmental Protection Agency must describe the characteristics and potential health and welfare effects that form the basis for setting, or revising, the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter (less than 10 micrometers [0.0004 inches] in diameter and less than 2.5 micrometers [0.0001 inches] in diameter). New pollutants may be added to or removed from the list of criteria pollutants as more information becomes available.

***cultural landscapes* —** Geographic areas where cultural and natural resources and wildlife have been associated with historic events, activities, or people, or which serve as an example of cultural or aesthetic value. The four types of cultural landscapes are historic sites (e.g., battlefields, properties of famous historical figures); historic designed landscapes (e.g., parks, estates, gardens); historic vernacular landscapes (e.g., industrial parks, agricultural landscapes, villages); and ethnographic landscapes (contemporary settlements, religious sites, massive geological structures). This latter category includes traditional cultural landscapes.

***cultural resources* —** A pre-contact or historic district, site, building, structure, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are usually divided into three major categories: pre-contact and historic archaeological resources, architectural resources, and traditional cultural resources.

***cumulative impacts* —** Impacts on the environment that result when the incremental impact of a proposed action is added to the impacts from other past, present, and reasonably foreseeable future actions, regardless of which agency (Federal or non–Federal) or person undertakes the other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (Title 40, *Code of Federal Regulations,* Section 1508.7).

***curie* —** The basis unit used to describe the intensity of radioactivity in a sample of material; it is equal to 37 billion disintegrations per second. One trillionth of a curie is a picocurie. (See *radioactivity*.)

***decibel* —** A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale (in general use, a degree of loudness).

decibels A-weighted (dBA) — A-weighted decibels are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced; no correction is made for audio frequency when unweighted decibels are used. The correction is made using dBAs because the human ear is less sensitive to low audio frequencies, especially those below 1000 Hertz, than high audio frequencies.

decommissioning — Removing facilities such as processing plants, waste tanks, and burial grounds from service and reducing or stabilizing radioactive contamination. Includes the following concepts: decontamination, dismantling, and return of an area to its original condition without restrictions on use or occupancy; partial decontamination; isolation of remaining residues; and continued surveillance and restrictions on use or occupancy.

decontamination — The actions taken to reduce or remove substances that pose a substantial present or potential hazard to human health or the environment, such as radioactive or chemical contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques.

depleted uranium — A byproduct of the uranium enrichment process and refers to uranium in which the percentage of uranium 235 is less than occurs naturally (0.7 percent).

dip — The angle at which a stratum or other planar feature is inclined from the horizontal. The strike of a structure is perpendicular to the direction of the dip.

disposal — As used in this environmental impact statement, the term is used for emplacing waste in a manner that ensures its isolation from the biosphere, with no intent of retrieval; as such, deliberate action would be required to gain access after emplacement.

disposal facility — A natural and/or man-made structure in which waste is disposed. (See *disposal*.)

dose (radiation) — As used in this environmental impact statement, it means total effective dose, a term referring to the amount of energy absorbed by a tissue or organ adjusted by a radiation weighting factor, a tissue weighting factor, and other factors that allows radiation of different types received through different modes of exposure to be compared on a common basis.

driver fuel (assembly) — The fuel required to run a reactor. Driver fuel is distinguished from other assemblies in the reactor. Reflector assemblies made of non-fuel material (e.g., HT-9 stainless steel) surround the driver fuel assemblies and function to reduce neutron leakage (i.e., they scatter back [or reflect] many neutrons into the core that would otherwise escape). Around the outside of the reflector assemblies are shield assemblies made of non-fuel material (e.g., HT-9 stainless steel) and containing neutron-absorbing boron carbide to reduce neutron damage to the reactor structural components.

emission — A material discharged into the atmosphere from a source operation or activity.

enriched uranium — Uranium in which the concentration of the isotope uranium-235, usually expressed as a percentage, exceeds the concentration occurring in natural uranium (0.7 percent). Low-enriched uranium (LEU), highly enriched uranium (HEU) and high assay, low-enriched uranium (HALEU) are all enriched forms of uranium.

environmental assessment — A concise public document prepared pursuant to the National Environmental Policy Act that provides sufficient evidence and analysis for determining whether a Federal agency should issue a Finding of No Significant Impact or prepare an environmental impact statement.

***environmental impact statement (EIS)* —** A detailed written statement required by Section 102(2)(C) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A U.S. Department of Energy (DOE) EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in Title 40, *Code of Federal Regulations*, Parts 1500-1508 (40 CFR Parts 1500–1508) and the DOE NEPA regulations in 10 CFR Part 1021. The statement includes, among other information, discussions of the environmental impacts of the proposed action and all reasonable alternatives; adverse environmental effects that cannot be avoided should the proposal be implemented; the relationship between short-term uses of the human environment and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources.

***environmental justice* —** The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies. Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations.

***ephemeral* —** A stream or drainage feature that flows only briefly and in response to precipitation in the immediate vicinity. The channel of the ephemeral feature is above the water table.

***ethnographic* —** Refers to time periods during which specific cultures existed and related information can be systematically studied and recorded. Formal study of Native American culture in the United States is considered to have begun in the late 1800s.

***exposure* —** Being exposed to a radioactive or chemical material.

***fast neutrons* —** Highly energetic neutrons (ranging from 0.1 million to 10 million electron volts [MeV] and travelling at speeds of thousands to tens of thousands kilometers per second) emitted during fission. The fast-neutron spectrum refers to the range of energies associated with fast neutrons.

***fast reactor* —** A class of advanced nuclear reactors in which the fission chain reaction is sustained by fast neutrons. Traditional reactors contain moderators that slow down neutrons (i.e., make them thermal neutrons) after they are emitted from the nucleus of an atom.

***fault* —** Linear geologic structures along which movement of rocks has taken place. Movement, or displacement, along the fault can be a few feet or hundreds of feet.

***fault zone* —** A fault that is expressed as a zone of many smaller faults. A fault zone may be hundreds of feet wide.

***Finding of No Significant Impact (FONSI)* —** A public document issued by a Federal agency that briefly presents the reasons why an action for which the agency has prepared an environmental assessment has no potential to have a significant effect on the human environment and, thus, does not require preparation of an environmental impact statement. (See *environmental assessment* and *environmental impact statement*.)

***fuel assembly* —** A hexagonal array of fuel pins, top and bottom reflectors (shields), surrounded by an assembly duct with assorted mechanical components. A VTR driver fuel assembly comprises 217 fuel pins. Sometimes called a subassembly.

fuel pin — A single rod of fuel. The pin consists of a cladding tube with top and bottom end plugs, contained fuel slugs that are sodium-bonded to the cladding, and an inert gas plenum above the fuel.

fuel slug — A cylindrical rod of alloyed fuel to be inserted into the fuel pin.

flux — See neutron flux.

gamma radiation — Gamma rays (and x-rays), unlike alpha or beta particles, are waves of pure energy. Gamma radiation is very penetrating and can travel several hundred feet in air. Gamma radiation requires a thick wall of concrete, lead, or steel to stop it. (See *alpha particle* and *beta particle*.)

global warming potential (GWP) — The ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to carbon dioxide, which has a value of one. For example, methane has a GWP of 28, which means that it has a global warming effect 28 times greater than carbon dioxide on an equal-mass basis.

glovebox — A sealed enclosure with gloves that allows an operator to manipulate materials and perform other tasks while keeping the enclosed material contained. Normally constructed of stainless steel with large acrylic/lead glass windows. In some cases, remote manipulators may be installed in place of gloves. The gloves, glass and siding material of the glovebox are designed to protect workers from radiation contamination and exposure.

greater-than-class C (low-level radioactive) waste — A type of low-level radioactive waste with concentrations of radionuclides that exceed the limits established in 10 CFR 61.55 for Class C low-level radioactive waste.

greenhouse gases — Gases that trap heat in the atmosphere by absorbing infrared radiation.

groundwater — Water below the ground surface in a zone of saturation.

half-life (radiological) — The time in which one-half of the atoms of a particular radionuclide disintegrate into another nuclear form. Half-lives for specific radionuclides vary from millionths of a second to billions of years.

hazardous air pollutants — Air pollutants that are not covered by the National Ambient Air Quality Standards, but may present a threat of adverse human health or environmental effects. Those specifically listed in Title 40, *Code of Federal Regulations*, Section 61.01 are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. More broadly, hazardous air pollutants are any of the 189 pollutants listed in or pursuant to Section 112(b) of the Clean Air Act. Very generally, hazardous air pollutants are any air pollutants that may realistically be expected to pose a threat to human health or welfare. (See *toxic air contaminants*.)

hazardous waste — Waste that is defined as hazardous waste under the Resource Conservation and Recovery Act (Title 42, *United States Code*, Section 6901 et seq.) or state statute or regulation. State regulations may define a larger spectrum of materials as hazardous waste than Federal regulations.

high assay, low-enriched uranium (HALEU) — Uranium in which the concentration of the isotope uranium-235 has been increased to over 5 percent, but less than 20 percent.

historic properties — Any pre-contact or post-contact districts, sites, buildings, structures, or objects included in, or eligible for inclusion in, the *National Register of Historic Places* (Title 36, *Code of Federal Regulations*, Sections 800.16(l)(1) and (2)).

hot cell — A shielded structure that requires the use of remote manipulators for handling hazardous or radioactive materials.

inert atmosphere — An atmosphere required in some gloveboxes and hot cells that replaces the ambient air. An inert atmosphere (e.g., of argon or nitrogen) is used in gloveboxes or hot cells where necessary to prevent test specimen degradation or unacceptable (e.g., pyrophoric) reactions that could occur in an air atmosphere.

ingot — An oblong block of metal (e.g., plutonium, uranium, zirconium, an alloy).

involved worker — A worker directly or indirectly involved with VTR operations at either the INL MFC or ORNL or reactor fuel production at either INF MFC or SRS who may receive an occupational radiation exposure from direct radiation (i.e., neutron, x-ray, beta, or gamma) or from radionuclides released to the environment.

isotope — Any of two or more variations of an element in which the nuclei have the same number of protons (i.e., the same atomic number) but different numbers of neutrons so that their atomic masses differ. Isotopes of a single element possess almost identical chemical properties, but often different physical and nuclear properties (e.g., carbon-12 and -13 are stable, but carbon-14 is radioactive).

latent cancer fatality — Deaths from cancer resulting from and occurring sometime after exposure to ionizing radiation or other carcinogens.

level of service — A qualitative measurement of operational conditions affecting the traffic on a roadway based on factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

low enriched uranium (LEU) — Uranium in which the concentration of the isotope uranium-235 has been increased above what occurs in nature (0.7 percent), but is below 20 percent.

low-level radioactive waste — Radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material. Test specimens of fissionable material that are irradiated for research and development only, not for the production of power or plutonium, may be classified as low-level radioactive waste, provided the transuranic concentrations are less than 100 nanocuries per gram of waste (DOE Order 435.1).

maximally exposed individual — A hypothetical individual worker or member of the public whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure pathways (inhalation, ingestion, external exposure).

maximum contaminant level (MCL) — Standards that are set by the United States Environmental Protection Agency for drinking water quality. An MCL is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act.

metric tons of heavy metal (MTHM) — A commonly used measure of the mass of nuclear fuel. Heavy metal refers to elements with an atomic number greater than 89 (e.g., thorium, uranium, and plutonium) in the fuel. The masses of other constituents of the fuel, such as cladding, alloy materials, and structural materials (and fission products in spent nuclear fuel), are not included in this measure. A metric ton is 1,000 kilograms, which is equal to about 2,200 pounds.

millirem — One-thousandth of a roentgen equivalent man (rem) (see r*oentgen equivalent man*).

mitigation — Includes: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

***mixed low-level radioactive waste* —** Low-level radioactive waste that also contains hazardous components regulated under the Resource Conservation and Recovery Act (RCRA) (Title 42, *United States Code*, Section 6901 et seq.) or state statute or regulation. State regulations may define a larger spectrum of materials as hazardous waste than Federal RCRA regulations.

***National Pollutant Discharge Elimination System (NPDES)* —** A provision of the Clean Water Act that prohibits discharge of pollutants into waters of the United States unless a special permit is issued by the U.S. Environmental Protection Agency, a state, or, where delegated, a tribal government. An NPDES permit typically includes effluent limitations based on applicable technology and water quality standards, as well as monitoring and reporting requirements, and may include other provisions such as special studies or compliance schedules.

***neutron* —** A subatomic particle with a mass similar to that of a proton and with no electric charge. Because it has no electric charge it can travel longer distances than alpha and beta particles without interacting with matter. A neutron is most effectively stopped by materials with high hydrogen content, such as water or plastic. (See *alpha particle* and *beta particle*.)

***neutron flux* —** A measure of the intensity of neutron radiation, determined by the rate of flow of neutrons. It is the product of neutron density times velocity, usually expressed in terms of neutrons per square centimeter per second.

***nonattainment area* —** An area that the U.S. Environmental Protection Agency has designated as not meeting (i.e., not being in attainment of) one or more of the National Ambient Air Quality Standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants, but not for others.

***nonhazardous waste* —** Discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations or from community activities. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (Title 42, *United States Code*, Section 2011 et seq.)

***noninvolved worker* —** A site worker outside of the facility who would not be subject to direct radiation exposure but could be incidentally exposed to radiological emissions from the VTR or reactor fuel production facility*.*

***Notice of Intent (NOI)* —** A notice published in the *Federal Register* that an environmental impact statement (EIS) will be prepared and considered. The NOI is intended to briefly describe the proposed action and possible alternatives; describe the agency's proposed scoping process, including whether, when, and where any scoping meeting(s) will be held; and state the name and address of a person within the agency who can answer questions about the proposed action and the EIS.

***off-link* —** A term used in radioactive transportation analyses to describe populations living within 0.50 miles of a shipment route.

***offsite* (adjective) —** Denotes a location, facility, or activity occurring outside of the boundary of a U.S. Department of Energy complex site.

***on-link* —** A term used in radioactive transportation analyses to describe pedestrians and car occupants sharing the shipment route.

***onsite* (adjective) —** Denotes a location or activity occurring within the boundary of a U.S. Department of Energy complex site.

***particulate matter (PM)* —** Any finely divided solid or liquid material, other than uncombined (i.e., pure) water. A subscript denotes the upper limit of the diameter of particles included. Thus, PM_{10} includes only those particles equal to or less than 10 micrometers (0.0004 inches) in diameter; $PM_{2.5}$ includes only those particles equal to or less than 2.5 micrometers (0.0001 inches) in diameter.

***permeability* —** A measure of a rock's ability to transmit fluid (in this case water); also, the rate at which the fluid can move a given distance over a given interval of time.

***person-rem* —** A unit of collective radiation dose applied to a population or group of individuals. It is calculated as the sum of the estimated doses, in rem, received by each individual of the specified population. For example, if 1,000 people each received a dose of 0.001 rem (1 millirem), the collective dose would be 1 person-rem (1,000 persons × 0.001 rem) (see *roentgen equivalent man* and *millirem*).

***polishing* —** The term used for removing undesirable components from plutonium. For example, americium-241 builds up from the decay of plutonium-241, so polishing may be needed for the plutonium to meet the specifications for a particular use.

***population dose* —** see collective dose

***radiation (ionizing)* —** Particles (alpha, beta, neutrons, and other subatomic particles) or photons (i.e., gamma, x-rays) emitted from the nucleus of unstable atoms as a result of radioactive decay. Such radiation is capable of displacing electrons from atoms or molecules in the target material (such as biological tissues), thereby producing ions.

***radioactive decay* —** The spontaneous transformation of one radionuclide into a different nuclide or into a different energy state of the same radionuclide. The process results in a decrease, with time, of the number of the radioactive atoms in a sample. Decay generally involves the emission from the nucleus of alpha particles, beta particles, or gamma rays. (See *half-life*.)

***radioactive waste* —** Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, that is of negligible economic value considering the costs of recovery.

***radioactivity* —**

Defined as a process: The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation.

Defined as a property: The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations.

***radioisotope or radionuclide* —** An unstable isotope that undergoes spontaneous transformation, emitting radiation. (See *isotope*.)

***Record of Decision (ROD)* —** A concise public document that records a Federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement. The ROD is prepared in accordance with the requirements of the Council on Environmental Quality National Environmental Policy Act regulations (Title 40, *Code of Federal Regulations*, Section 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternative(s), factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not. (See *environmental impact statement*.)

reflector assemblies — See driver fuel.

***region of influence* —** A site-specific geographic area in which the principal direct and indirect effects of actions are likely to occur and are expected to be of consequence for local jurisdictions.

rem — See r*oentgen equivalent man.*

remediation — The process, or a phase in the process, of rendering land or water containing radioactive or hazardous constituents, or both, environmentally safe, whether through removal, processing, entombment, or other methods.

risk — The probability of a detrimental effect from exposure to a hazard. To describe impacts, risk is often expressed quantitatively as the probability of an adverse event occurring, multiplied by the consequence of that event (i.e., the product of these two factors). However, a separate presentation of probability and consequence to describe impacts is often informative.

roentgen — A unit of exposure to ionizing radiation equal to the amount of gamma or x-rays that produces one electrostatic unit charge in a cubic centimeter of air. (See *gamma radiation.*)

roentgen equivalent man (rem) — A unit of radiation dose used to measure the biological effects of different types of radiation on humans. The dose in rem is estimated by a formula that accounts for the type of radiation, the total absorbed dose, and the tissues involved. One thousandth of a rem is a millirem. (See *absorbed dose and millirem*.)

sacred sites — Well-known areas that are associated with the cultural practices or beliefs of a living community.

sandstone — Rock composed of sand-sized particles that also contains finer-grained particles that form the "matrix" or the material in which the sand grains are embedded.

scope — In a document prepared pursuant to the National Environmental Policy Act, the range of actions, alternatives, and impacts to be considered.

scoping — An early and open process for determining the scope of issues and alternatives to be addressed in an environmental impact statement (EIS) (or other National Environmental Policy Act [NEPA] document) and for identifying the significant issues related to a proposed action. The scoping period begins after publication in the *Federal Register* of a Notice of Intent to prepare an EIS (or other NEPA document). The public scoping process is that portion of the process where the public is invited to participate. The U.S. Department of Energy (DOE) also conducts an early internal scoping process for environmental assessments or EISs (and supplemental environmental impact statements [SEISs]). For EISs and SEISs, this internal scoping process precedes the public scoping process. DOE's scoping procedures are found in Title 10, *Code of Federal Regulations*, Section 1021.311.

shale — Rock composed predominately of clay-sized particles.

shield assemblies — See driver fuel.

siltstone — Rock composed predominately of silt-sized particles.

soils — All unconsolidated materials above bedrock. Also, natural earthy materials on the Earth's surface, in places modified or even made by human activity, that contain living matter and support or are capable of supporting plants out of doors.

Test assembly — A hexagonal assembly within the active region of the core that holds a test specimen. Test assemblies may be normal test assemblies (contains non-instrumented or passively instrumented test specimens), extended length test assemblies (include an instrument stalk that allows the test specimen to be monitor while in the reactor core), or rabbit test assemblies (part of a rabbit facility and contains specimens that can be inserted and removed from the core during reactor operations).

thermal neutrons — Neutrons that are less energetic than fast neutrons (generally, less than 1 electron volt and travelling at speeds of less than 5 kilometers per second), having been slowed by collisions with

other materials such as water. The thermal neutron spectrum refers to the range of energies associated with thermal neutrons.

traditional cultural properties — Areas that are associated with the cultural practices or beliefs of a living community that link the community to its past, are "important in maintaining the continuing cultural identity of the community," and are potentially eligible for listing or are listed on the *National Register of Historic Places*. Traditional cultural properties may also be associated with other traditional life ways, such as agriculture. Traditional cultural properties can include archaeological resources, locations of pre-contact or post-contact events, sacred areas, traditional hunting and gathering areas, or landscapes.

tritium — A beta-particle-emitting radioactive isotope of hydrogen whose nucleus contains one proton and two neutrons. Because it is chemically identical to natural hydrogen, tritium can easily be taken into the body by any ingestion pathway. (See *neutron*.)

TRU (transuranic) waste — waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for — (a) high-level radioactive waste; (b) waste that the Secretary [of Energy] has determined, with the concurrence of the Administrator (of the Environmental Protection Agency], does not need the degree of isolation required by the disposal regulations; or (c) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with part 61 of title 10, Code of Federal Regulations.

vadose zone — The unsaturated soil above the water table. The vadose zone may contain residual water, but it is not completely saturated. Air and gases in the vadose zone are under atmospheric pressure.

viewshed — The extent of the area that may be viewed from a particular location. Viewsheds are generally bounded by topographic features such as hills or mountains.

volatile organic compounds — Organic chemicals that have a high vapor pressure at ordinary room temperature. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air.

water table — The surface of an aquifer or perched zone formed by the upper limit of the zone of saturation; along this surface, the pressure is the same as atmospheric pressure.

wetland — An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.